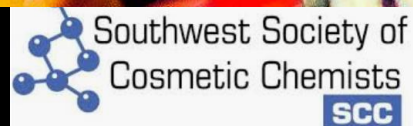




The functionality of Pigments in Color Cosmetics

Stellie Balthazard

August 21th, 2019



The functionality of Pigments in Color Cosmetics

Color Definition

- Color Wheel
- Color System

Pigments

- Definition
- Pigments & Science

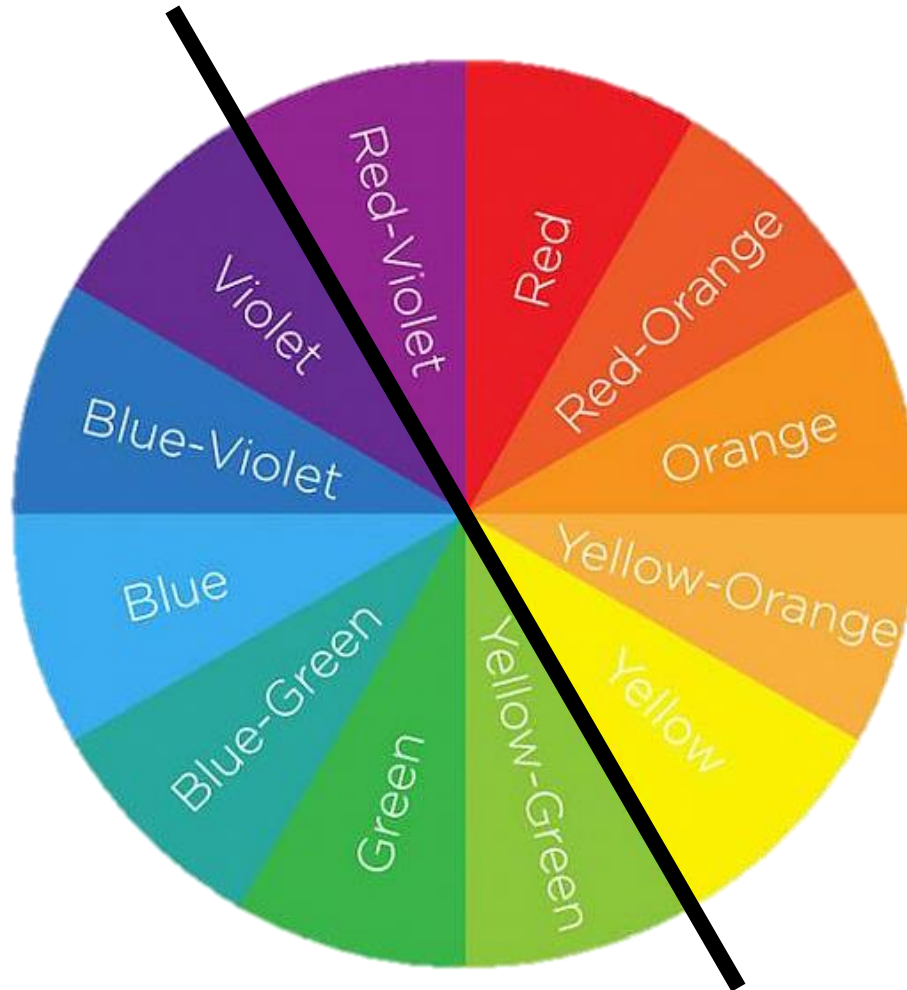


Color Definition – Color Wheel

Cool Colors

- Cold
- Tranquility
- Mystery
- Sadness
- Darkness

- Remind us of: ice, cold, winter, death

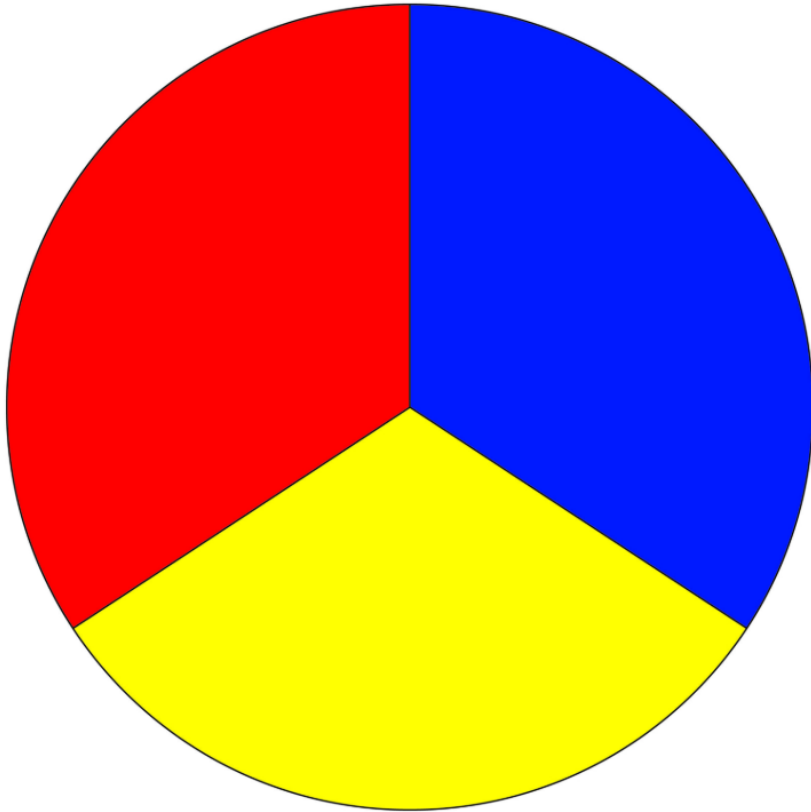


Warm Colors

- Bright
- Warmth
- Passionate
- Energetic
- Tend to be eye-popping

- Remind us of: sun, love, fire, festivities

Color Definition – Color Wheel

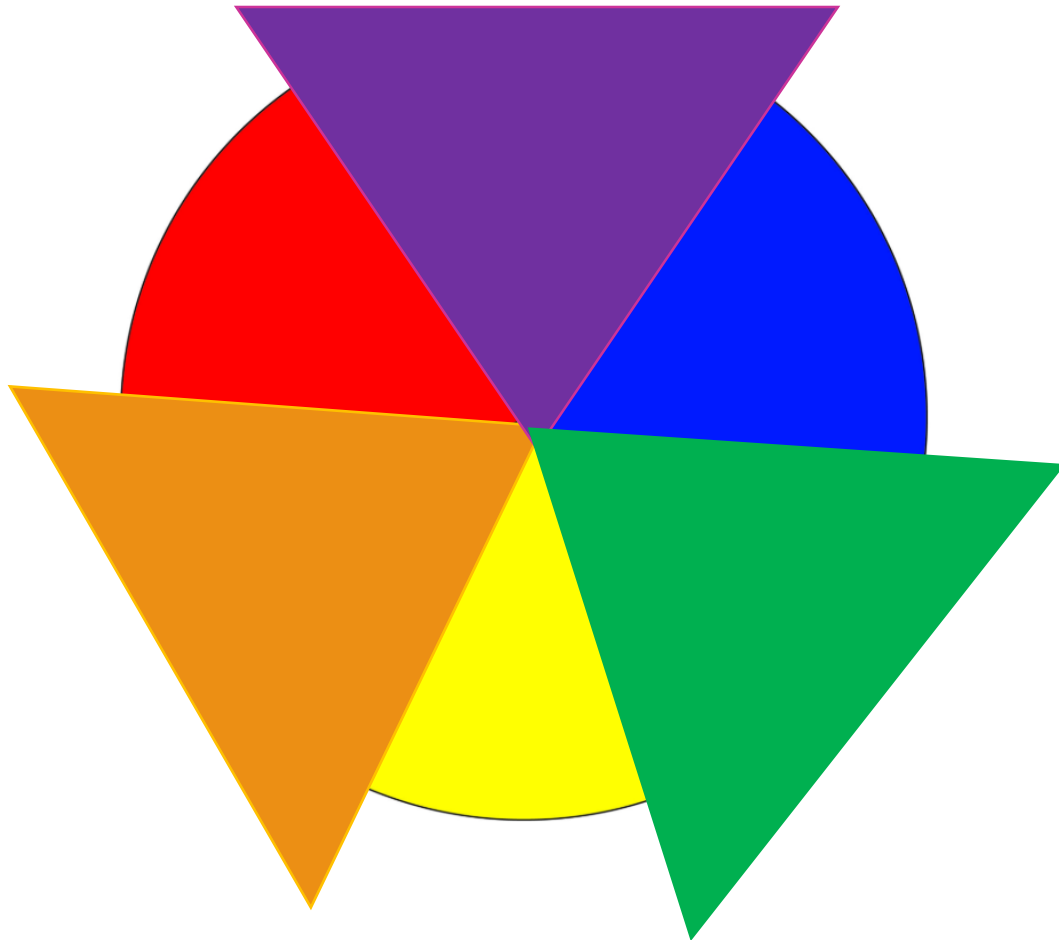


PRIMARY COLORS:

Red, Yellow, Blue

- ✓ These three primary colors are the **foundation of the color wheel.**
- ✓ Their true color **cannot be created** by mixing any other combination of colors.
- ✓ **All other colors in the color wheel are derived** from these three color hues.

Color Definition – Color Wheel



SECONDARY COLORS: Violet, Orange, Green

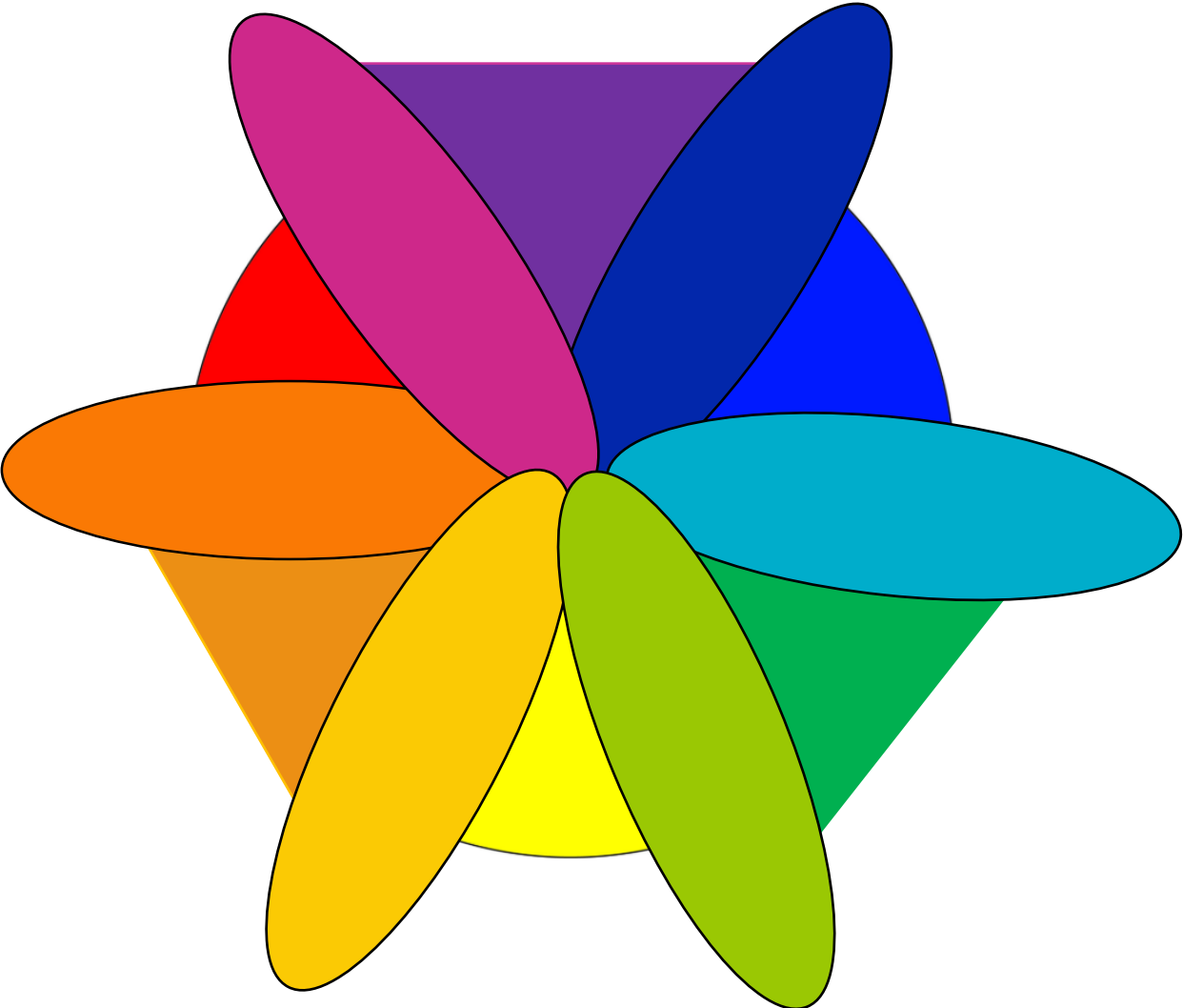
These secondary color hues are created by mixing two primary colors together.

Red + Blue = Violet

Red + Yellow = Orange

Blue + Yellow = Green

Color Definition – Color Wheel



TERTIARY COLORS:

- These are the colors formed by mixing a primary and a secondary color.
- That's why the hue is a two word name, such as **blue-green**, **red-violet**, and **yellow-orange**.

Yellow-Green



Yellow-Orange



Red-Orange



Blue-Green



Blue-Violet

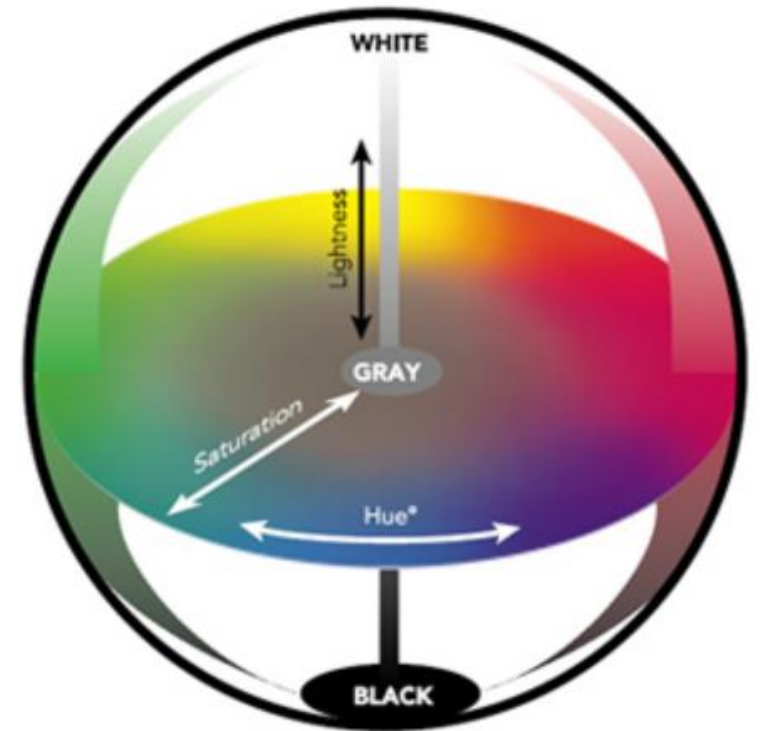


Red-Violet



Munsell Color System

- Visually identify and match color using a scientific approach.
- Developed by Albert H. Munsell who wished to create a “rational way to describe color.”
- System uses decimal notation rather than color names.
- Three dimensions of Color Space:
 - HUE = COLOR
 - VALUE = BRIGHTNESS
 - CHROMA = SATURATION



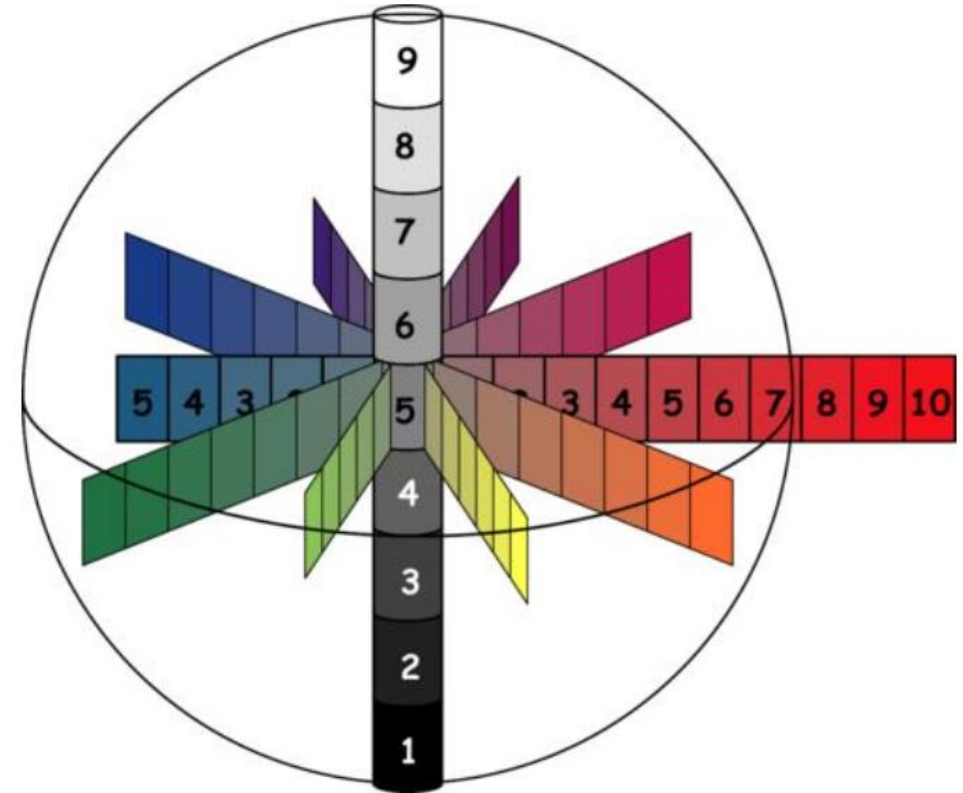
Munsell Color System

- **VALUE**

- *how light or dark a color is*
- scale runs vertically and moves from lightest (at the top) to darkest (at the bottom)
- 0 pure black to 10 for pure white

- **CHROMA**

- *how weak or strong a color is*
- scale runs horizontally and moves from weak (from the left) to strong (to the right)



Color System – Example of Black Iron Oxides

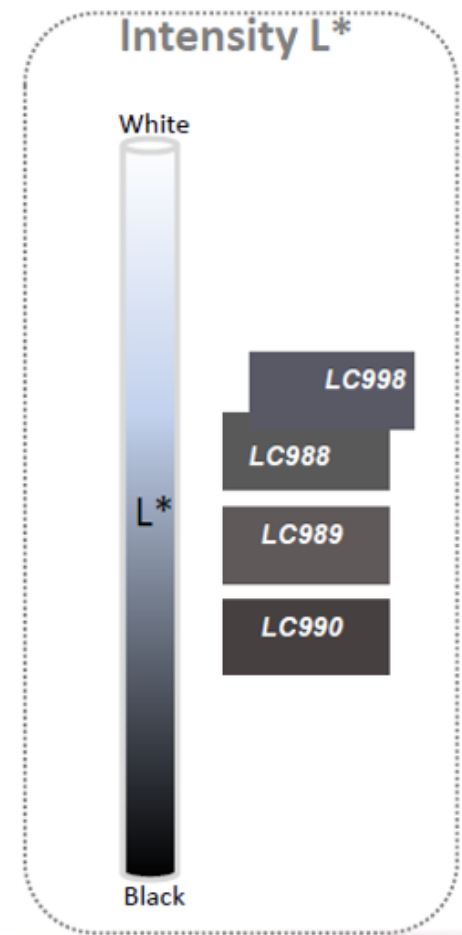
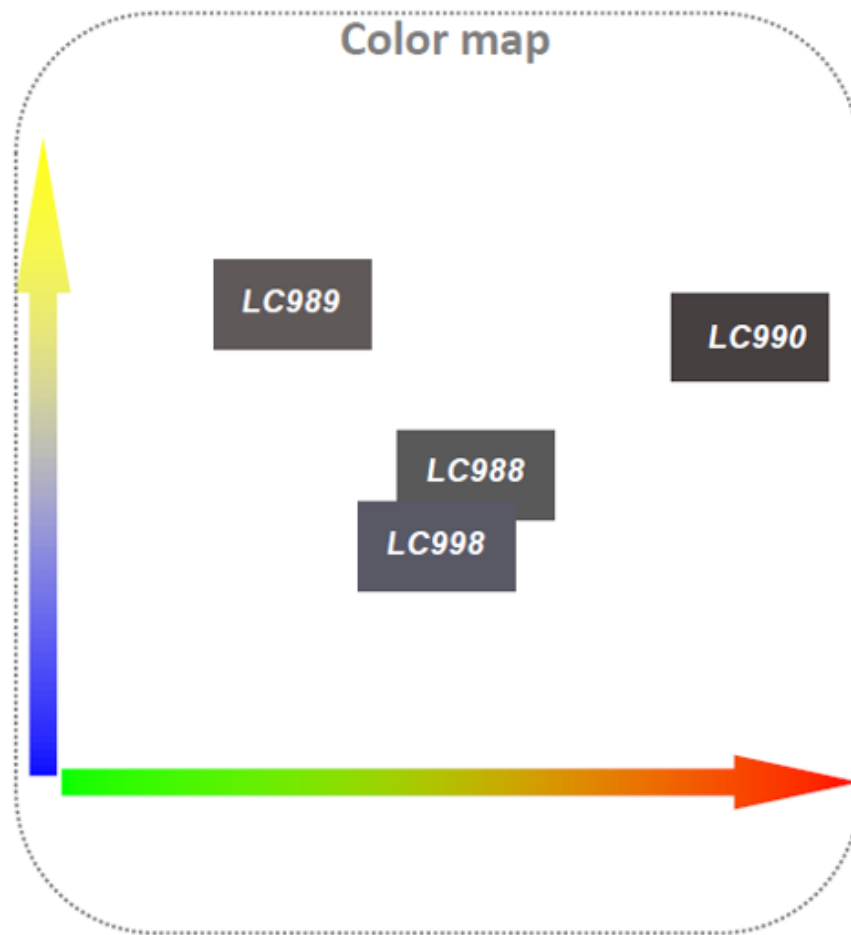


Unipure Black
LC988

Unipure
Black LC998

Unipure Black
LC989

Unipure Triple
Black LC990



Pigment versus Dye

DYE



- ✓ Soluble
 - ✓ Water
 - ✓ Oil
- ✓ Transparent solution
- ✓ Sensible to light, heat and pH
- ✓ Natural & Synthetic

PIGMENT



- ✓ Insoluble
- ✓ Dispersible
 - ✓ Water
 - ✓ Oil
- ✓ Opacity
- ✓ Natural & Synthetic
- ✓ Made by absorbing the dye on a substrate.

Pigment Families

MINERAL PIGMENTS

- Titanium Dioxide
 - ✓ Rutile : more opaque, more yellow
 - ✓ Anatase: more transparent, whiter
- Zinc Oxide
- Iron Oxides: Yellow, Red, Black
- Chromium Oxide (Green)
- Ultramarines (Pink or Blue)
- Manganese Violet

NATURAL PIGMENTS

- Carmin
- Carbon Black

ORGANIC PIGMENTS

- Red 6 Lake
- Red 7 Lake
- Red 28 Lake
- Red 30 Lake
- Red 33 Lake
- Red 40 Lake
- Blue 1 Lake
- Yellow 5 Lake
- Yellow 6 Lake



Pigments - Regulatory

Application Type:

- Face
- Lips
- Eyes

Country Regulation



Modification of Technical Properties through Surface Treatment

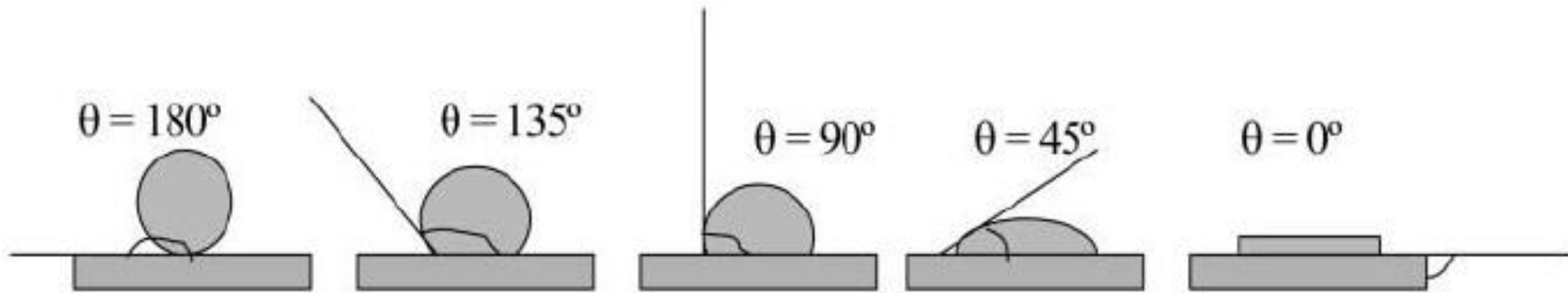
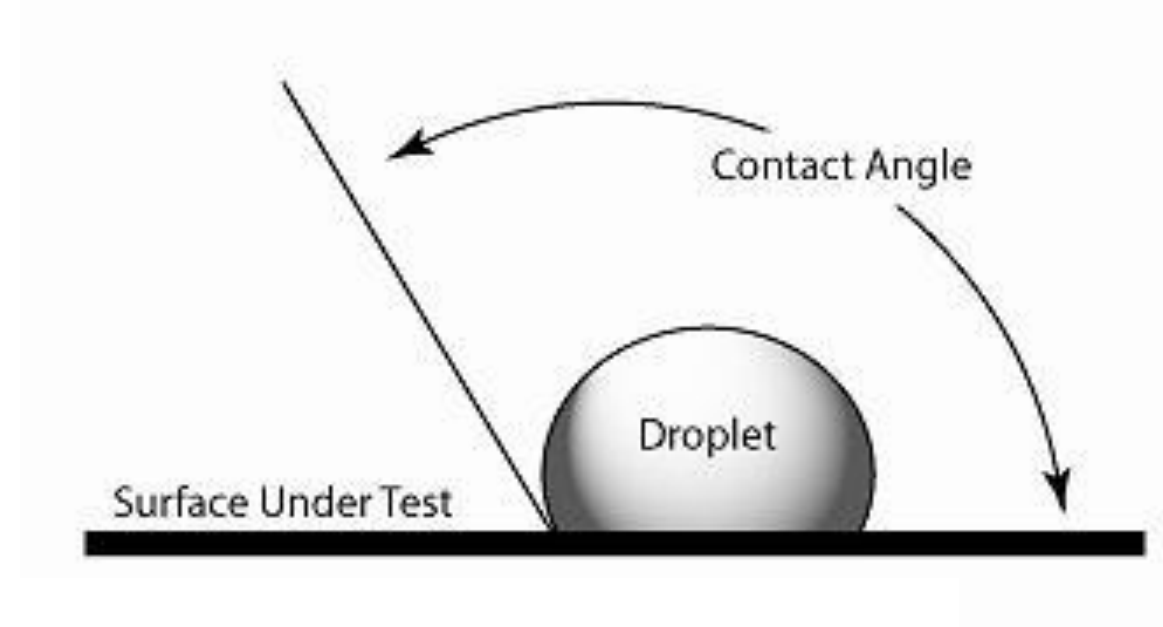
- Hydrophobicity
- Oil Absorption
- Process Improvement
 - No grinding/milling necessary
 - Better Binding property
 - Easy Pouring
- Aesthetics
 - Visual Effect
 - Sensoriality



Pigment & Science - Hydrophobicity

Modification of Technical Properties:

➔ **Contact Angle (Goniometer):
DETERMINES HYDROPHOBICITY**



SuperHydrophobic $\theta > 150$

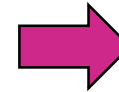
Hydrophobic $90 < \theta < 150$

Hydrophilic $\theta < 90$

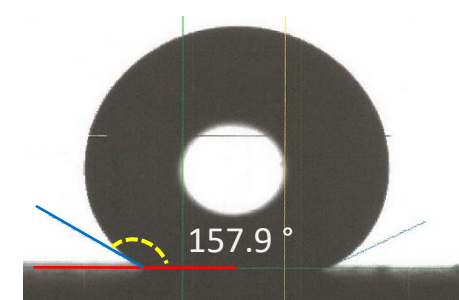
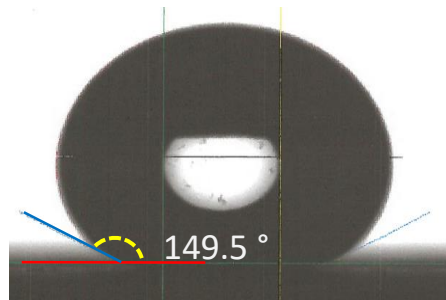
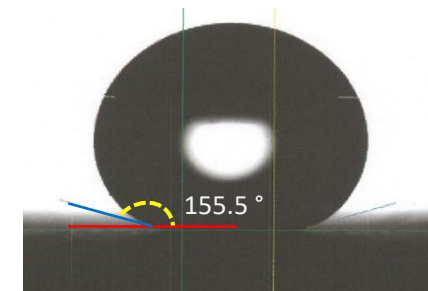
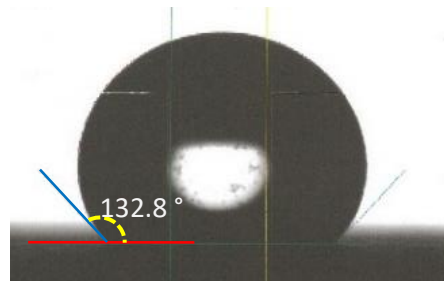
Pigment & Science - Hydrophobicity

Modification of Technical Properties:

Hydrophobic to hyperHydrophobic



IMPROVES LONG WEAR



Pigment & Science – Oil Absorption

Modification of Technical Properties:

Oil Absorption → FLUID & LIGHT TEXTURES



Untreated Pigment
Blend in CCT (50/50)
Viscosity: 144,000 cps

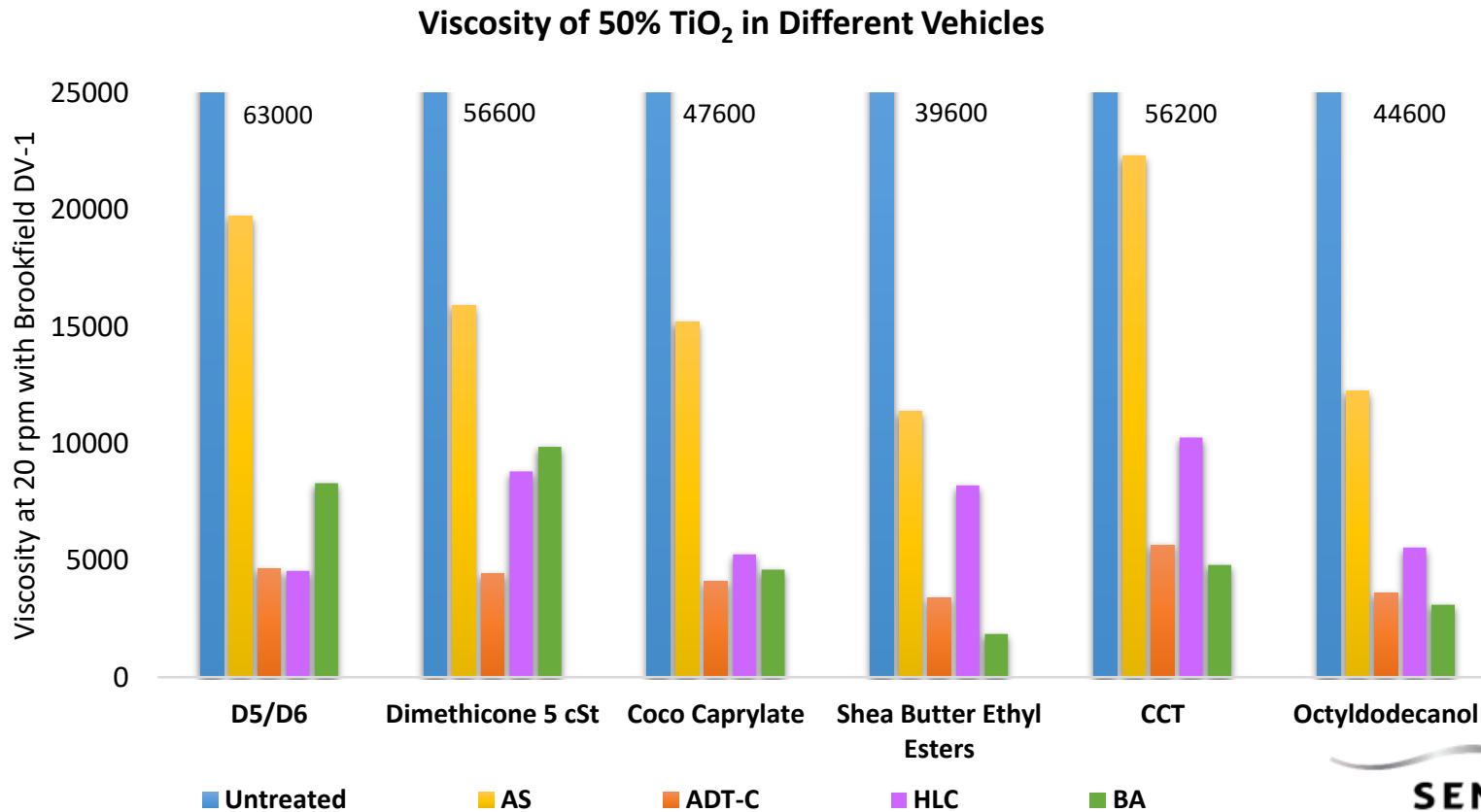
Untreated Pigment Blend
+ Oil used in surface
treatment added separately
in CCT (50/50)
Viscosity: 104,000 cps

Surface Treated Pigment
Blend in CCT (50/50)
Viscosity: 5,950 cps

Pigment & Science – Oil Absorption

Modification of Technical Properties:

Oil Absorption → FLUID & LIGHT TEXTURES

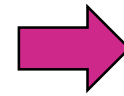


Pigment & Science – Process Improvement

Modification of Technical Properties:

Surface Treatment

No grinding/milling necessary



DIRECT INCORPORATION
EASY SHADE ADJUSTMENT
FASTER PROCESS

15% Pigments added
into O/W emulsion



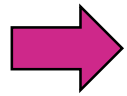
Untreated Pigments

Treated Pigments

Pigment & Science – Process Improvement

Modification of Technical Properties:

Surface Treatment in Pressed Powders



**BETTER BINDING PROPERTY - LESS BINDER NECESSARY
CAN ACHIEVE HIGH PEARL CONTENT**

Drop Test
5 times at 45cm



15% of Untreated Pearls
+ 2% Binder

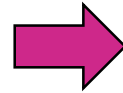


15% of Treated Pearls
+ 2% Binder

Pigment & Science – Process Improvement

Modification of Technical Properties:

Surface Treatment



EASY POURING (*Lipstick, Hot Pour*)
HIGHER COVERAGE POSSIBLE

15% Pigments (Red 6 Lake)
in Lipstick formulation



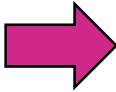
Treated Pigment 1

Treated Pigment 2

Pigment & Science – Aesthetics

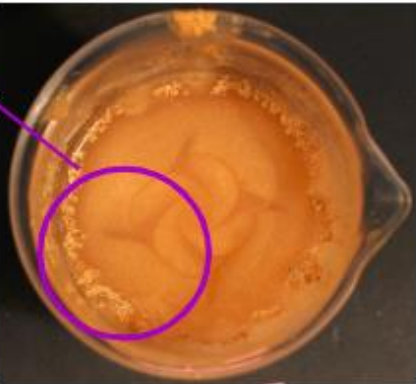
Modification of Technical Properties:

Surface Treatment

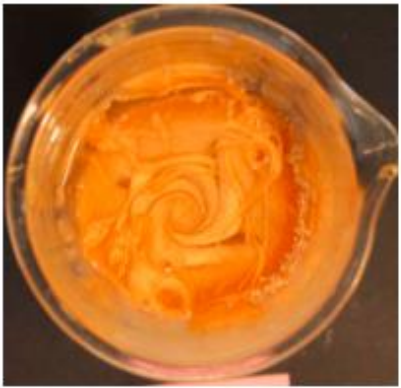


PREMIUM VISUAL EFFECT

Agglomerates



Untreated Pearls



5 min of mixing



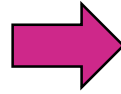
10 min of mixing

Treated Pearls

Pigment & Science – Aesthetics

Modification of Technical Properties:

Surface Treatment



DIRECT IMPACT ON FEEL
OF FINAL PRODUCT

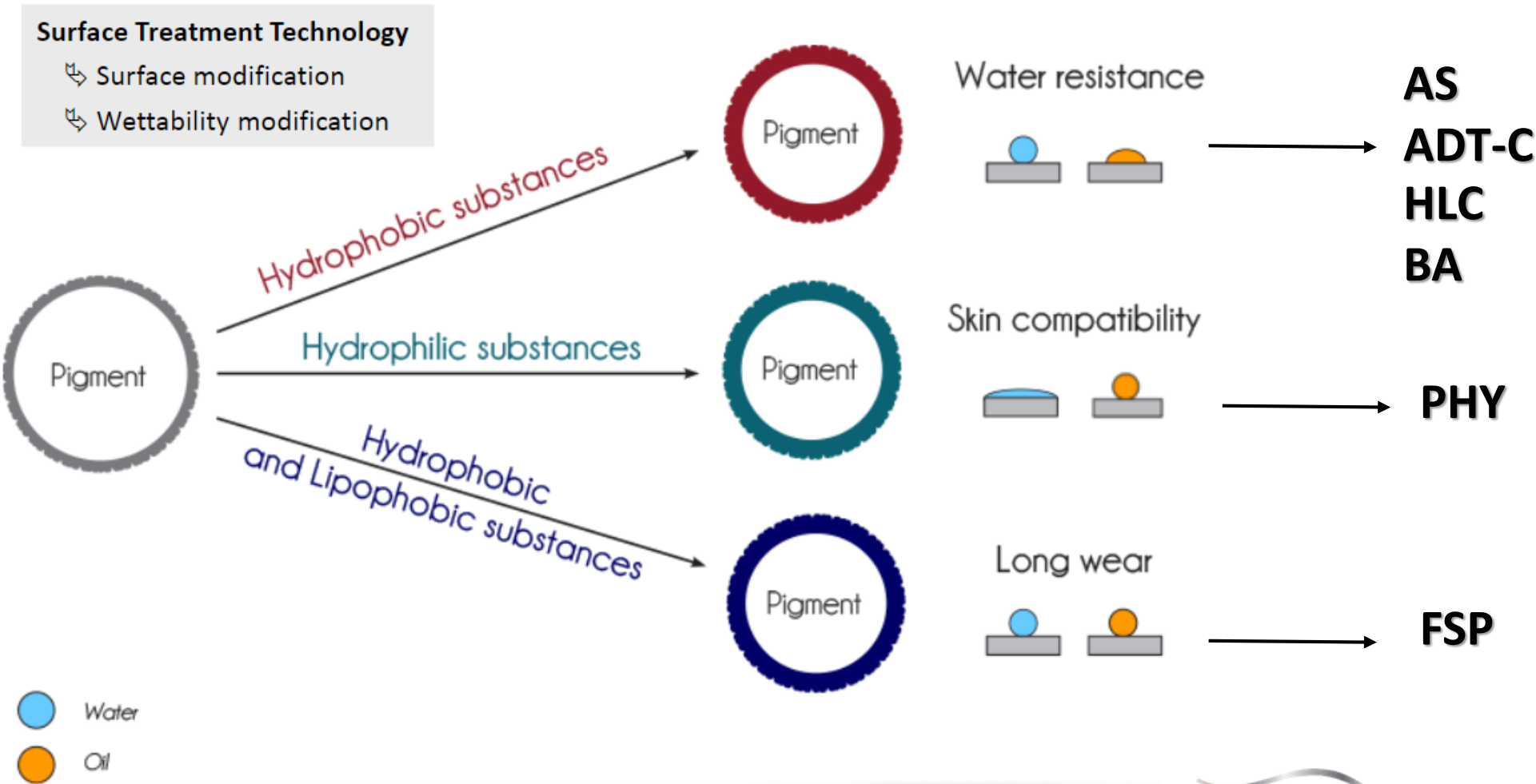
- **Liquid Foundation :**
 - 15 to 20% pigments: give color and shade desired but not only:
Bring unique sensoriality
Allow new texture and feel
Improve performance of final product
- **Pressed Powders:**
 - Pigments
 - Fillers
 - Pearls



SENSIENT Technologies – How we can help you!



SENSIENT Technologies – How we can help you!





Hydrophobic Surface Treatments



HLC
Natural and
Creamy Feel



ADT-C
High Color Deposition
and Long Wear
Performance



BA
Natural High Load
and Lightweight Feel





Hydrophilic Surface Treatments

**Light and fresh formulations!
Possibility to innovate and create new textures!**



AQ
**Dispersible in water with
Better Suspension Property**



PHY
**Natural and Direct
Incorporation in water**

Thank you !

Any further question?

Feel free to contact me!

Stellie Balthazard

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Sensient Cosmetic Technologies North America

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